









The Use of Technology Enabled Rideshare Services in New Jersey: An examination of Uber Usage in the Garden State

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Today's Discussion Topics

- Big Data in Transportation
- Taxis
- Transportation Network Companies
- Uber in New York / New Jersey Region
- Uber in New Jersey via Transit App data

Big Data – Big Analysis Questions!

- Large Scale Data is presenting new opportunities for quantitative analysis
- New Technology applications are producing large scale data from various sources
- What can we learn from large scale data?
- How can it inform our business planning decisions?
- How can it inform public policy?

Terms and Discussion Topics

- Digital Exhaust
- Scraping
- Open Data
- Hacking Camps and Such
- Apps World

What is Big Data?

- Big Data is Big
- Big is larger than 32 Gigabytes
- Changes over time
- 35
- 3

From Wikipedia:

- "Big data is a blanket term for any collection of data sets so large and complex that it becomes difficult to process using on-hand database management tools or traditional data processing applications.
- The challenges include capture, curation, storage, search, sharing, transfer, analysis and visualization."

Table 1: Large Scale Corporate Data Bases

•	Date	Size	Firm
•	1950's	600,000,000 - 600 MB	John Hancock
•	1970's	80,000,000,000 - 80 GB	FedEx
•	1980's	450,000,000,000 - 450 GB	Citicorp
•	1990's	180,000,000,000,000 – 180 TB	Wal-Mart
•	2010's	100,000,000,000,000 – 100 PB	Facebook or Google

Source – Wall Street Journal – March 11, 2013

Big Data Example – NYC Taxi

Columbia University / Arizona State University &

College of Staten Island

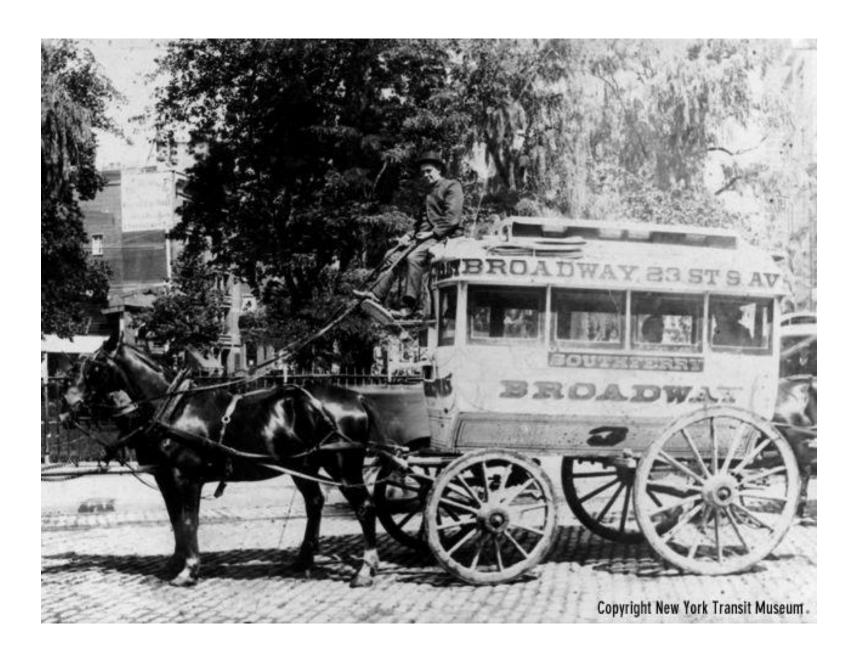
New York City Medallion Data

- In March 2005, the New York City Taxi and Limousine Commission (NYC TLC) issued a Request for Proposals to develop and deploy a new system of fare collection for their medallion (Yellow) cab fleet (12,533 medallions increased to 13,587 by February 2014).
- The system was designed to provide both credit card based fare collection and enhanced passenger information.
- Included in the technology package was an electronic trip sheet function that recorded the origin, destination, fare, payment method and other information.
- This system was initially operational in February 2008 and fully deployed as of January 2009.
- This data is recorded on a trip by trip basis and is stored in NYC TLC databases.
- 8288 Street Hail Livery Licenses Issued by Oct 2016 (Green Cabs)

History of Taxi Cabs

- Service provided in many cities around the world

 large and small.
- Licensed for a number of reasons
- First service initiated in Paris in 1640
- Licensed since 1654 in the United Kingdom
- Standard vehicle types since 1834 –
 "Hansom Cab"
- Various Names Taxi, Limousine, Jitney, Hackney, Taxibus, Shuttle – all For Hire Vehicle Services.

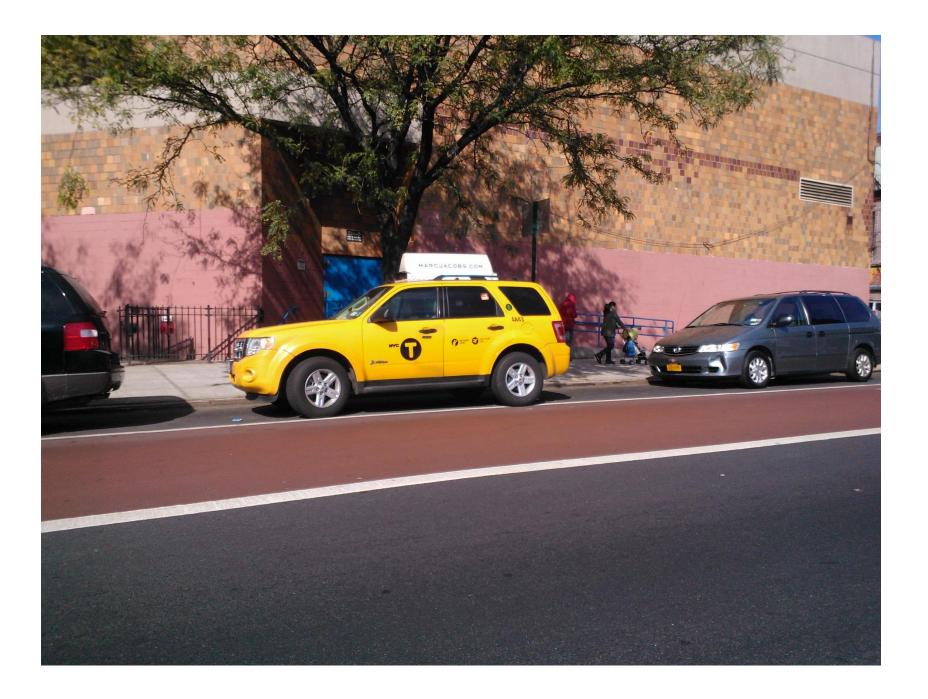




HANSOM CAB photographed in London in 1895. (Smithsonian photo.)







New Meter System – with GPS



Now - Two Types of Taxi in NYC



Yellow "Traditional " Taxi Medallion System – Introduced in 1937 as the Haas Act – Limited medallions.

Medallions used to trade for about \$1,000,000 each and are rented to drivers for a set fee. Current prices are \$450,000 to \$650,000 each.

Green Taxi – Outer Borough Taxis Intended to serve Northern Manhattan And the Four Other Boroughs.

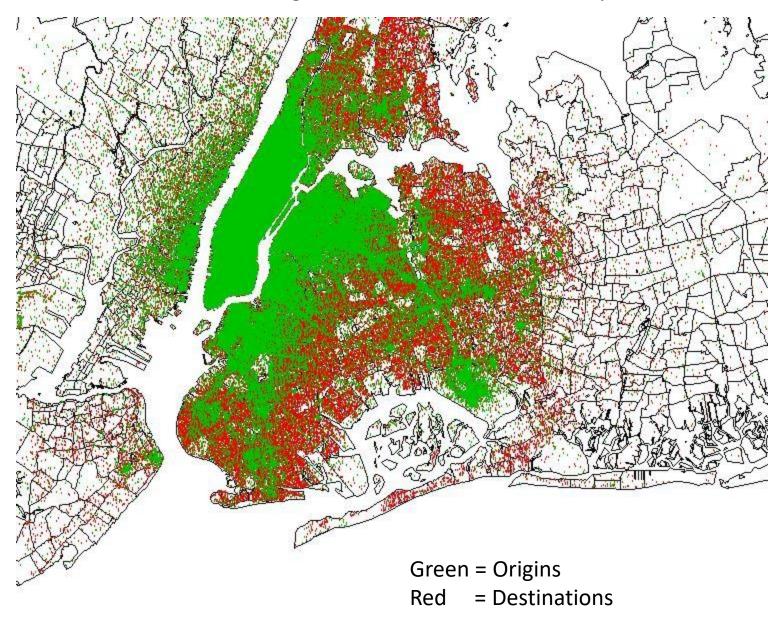
Fee is \$1,500 per year.

Delayed for two years subject to litigation from the medallion industry.

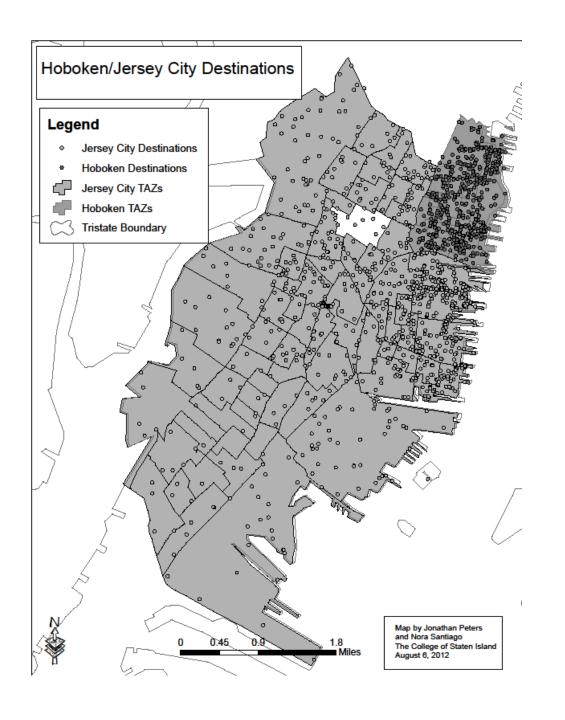
Research Examples from Taxi Data

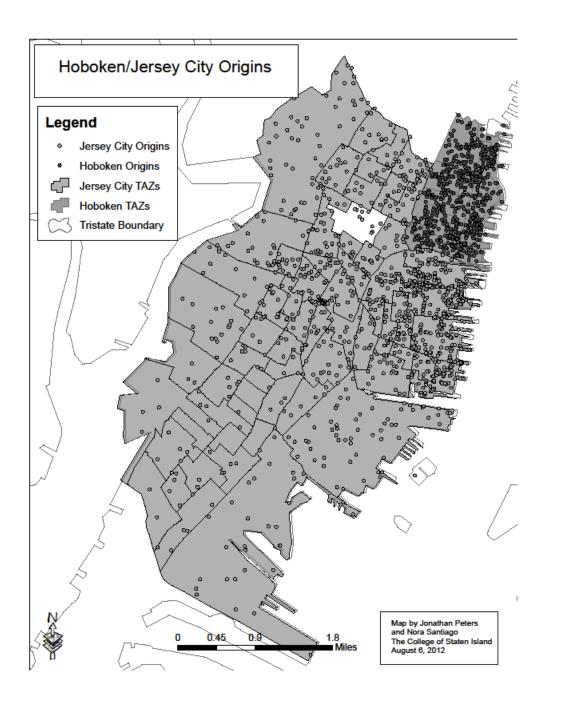
- Can the taxi data inform equipment operators and regulators? (Detect Fraud)
- Can the taxi data inform public planning for regions? (Understand Congestion)
- Can the taxi data inform users of a service to consume optimally? (Route Choice)
- Can the taxi data inform providers of services (drivers) how to best serve market? (Best Markets)

Yellow Cab - Origins and Destinations – February 2010

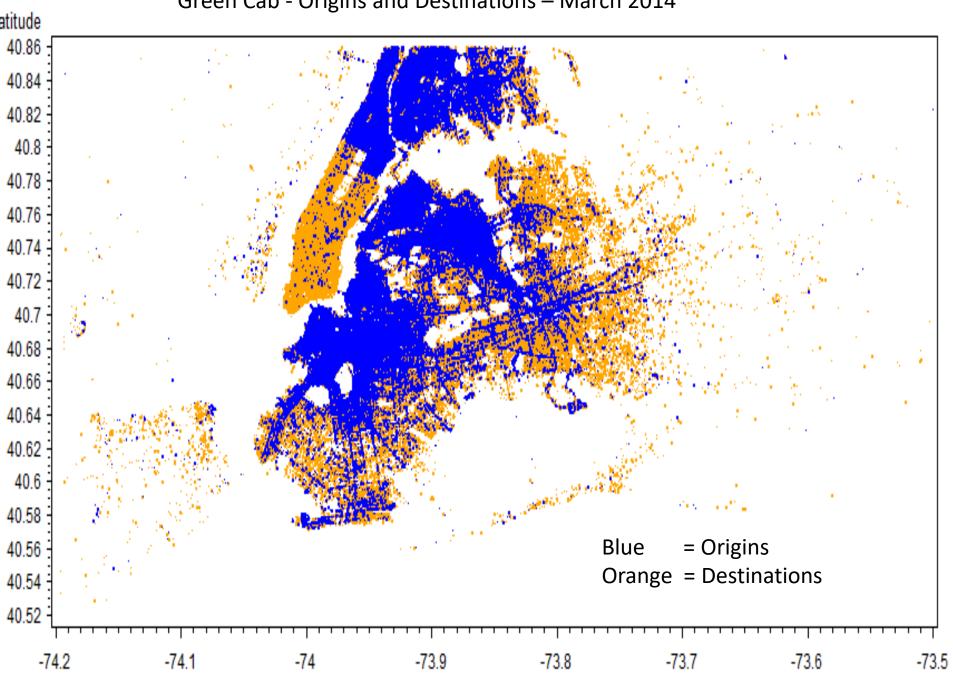




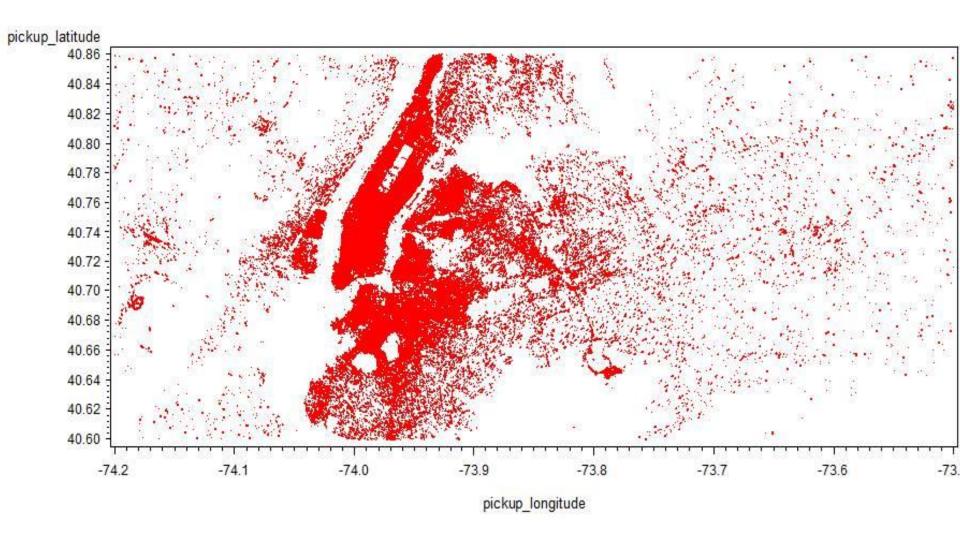




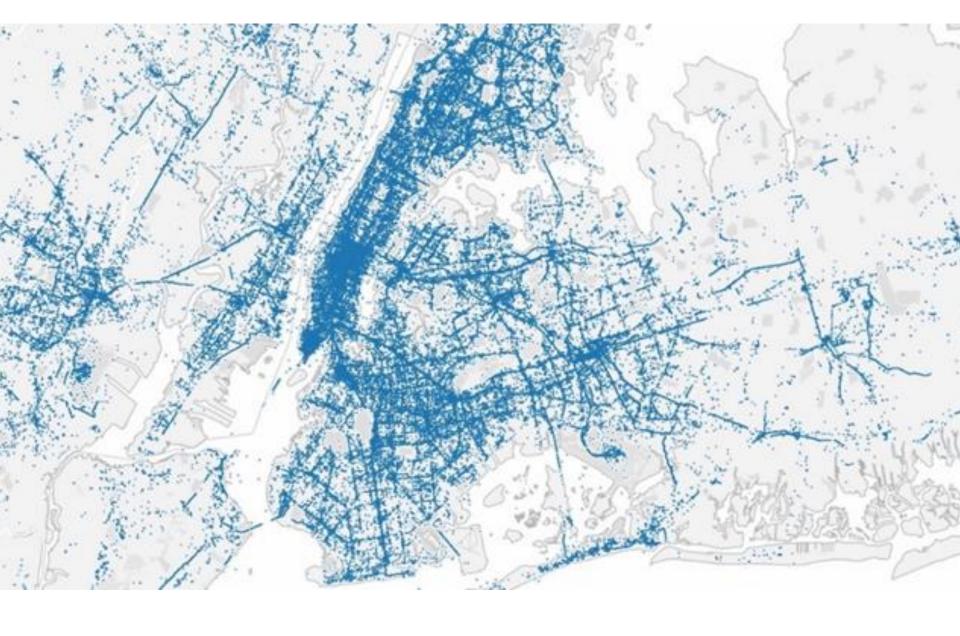
Green Cab - Origins and Destinations - March 2014



Uber Trips Origins in "New York" – From Uber



Data Obtained From Uber by NYC Taxi and Limousine Commission for April – October 2014



Transit App Requests – A New Source of Data

Preliminary Research Results. Please do not quote or cite.

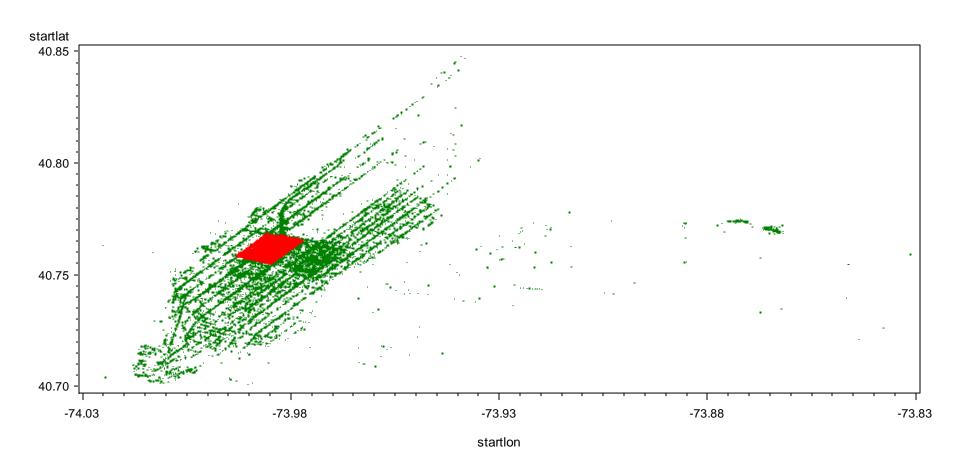
Theater District Taxi Trips

From NYC Taxi Data

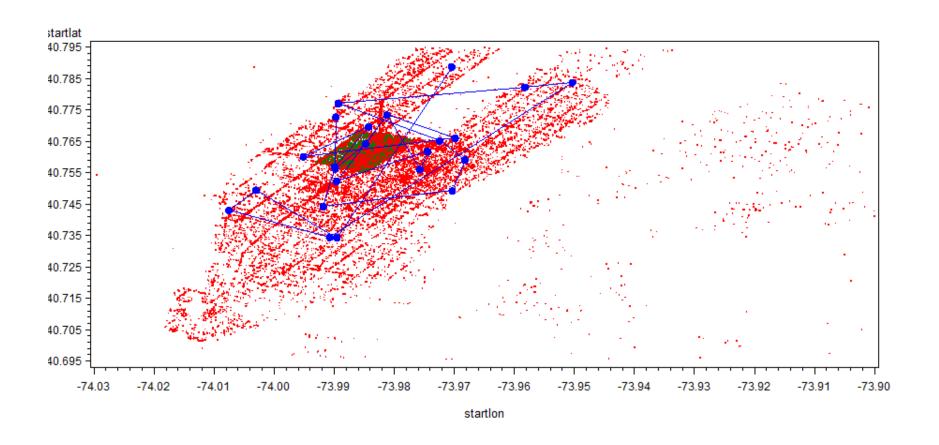
CUNY SPSC

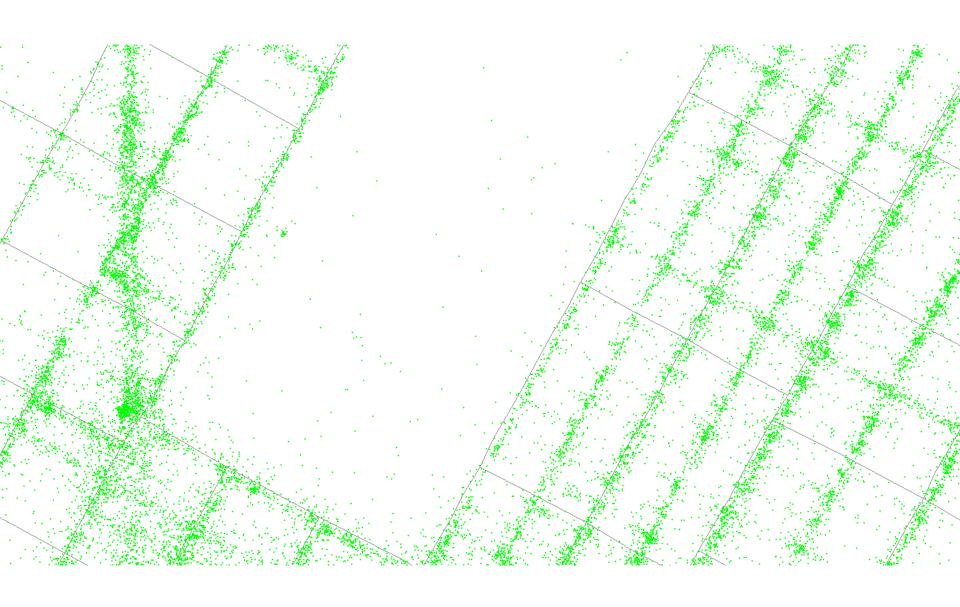
CUNY HPC – January 2014

Inbound to Theater District



Outbound from Theater District





New Systems and Options

Mobility Modes











Sidecar - DOA













Ridesharing Companies

- A transportation network company (TNC) connects paying passengers with drivers who provide the transportation on their own non-commercial vehicles. All parties connect to the service via <u>website</u> and <u>mobile apps</u>.
- In California, The Public Utilities Commission The commission established regulations for TNC services at the same time as the definition. These included driver background checks, driver training, drug and alcohol policies, minimum insurance coverage of \$1 million, and company licensing through the Public Utilities Commission
- From Wikipedia



Are These New Services Good or Bad?

Depends Upon Who You Ask
Depends Upon What Are Your Goals





ABOUT US

The NJTCA represents taxi cab owners and drivers in working with New Jersey State government and law enforcement to ensure that the taxi industry remains strong and provides the safe and affordable service that people have depended upon for over a 100 years.

Taxi cab owners know through their own personal experiences and through national headlines that Transportation Network Companies, such as Uber, Lyft, Sidecar and others, have decimated the taxi cab industry in cities and states around the country.



CALL TO ACTION

This is your opportunity to protect your investment and level the playing field by adding your voice with other members of the taxi industry and help us pressure the New Jersey Legislature and the Governor's office to do the right thing – to stop these illegal operations and level the playing field. Make sure everyone is held to the same standard and ensure passengers know they are getting into

MISSION STATEMENT

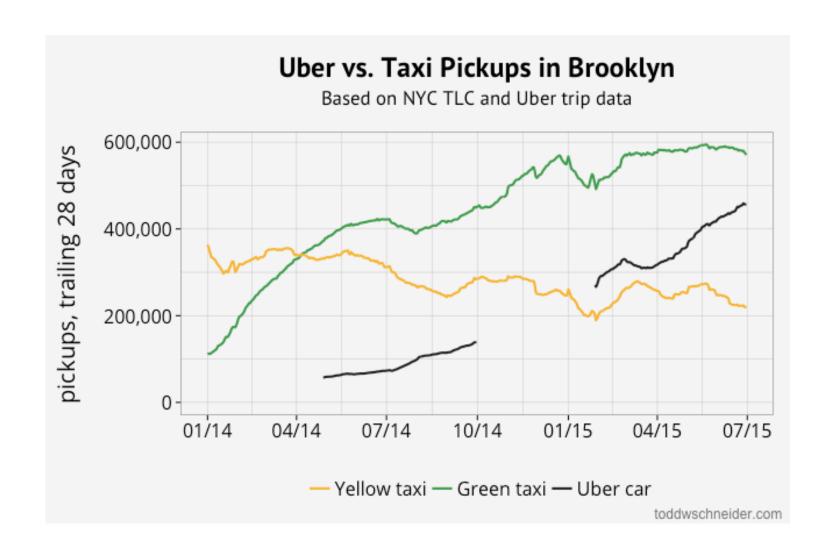
The NJTCA provides a statewide forum for the exchange of information and views by members of the NJTCA.

The NJTCAprovides a mechanism for the collection of information and inform members concerning matters of mutual interest and concern.

The NJTCA advances the interest of the industry and its members before the New Jersey Senate and Assembly and other States regulatory authorities

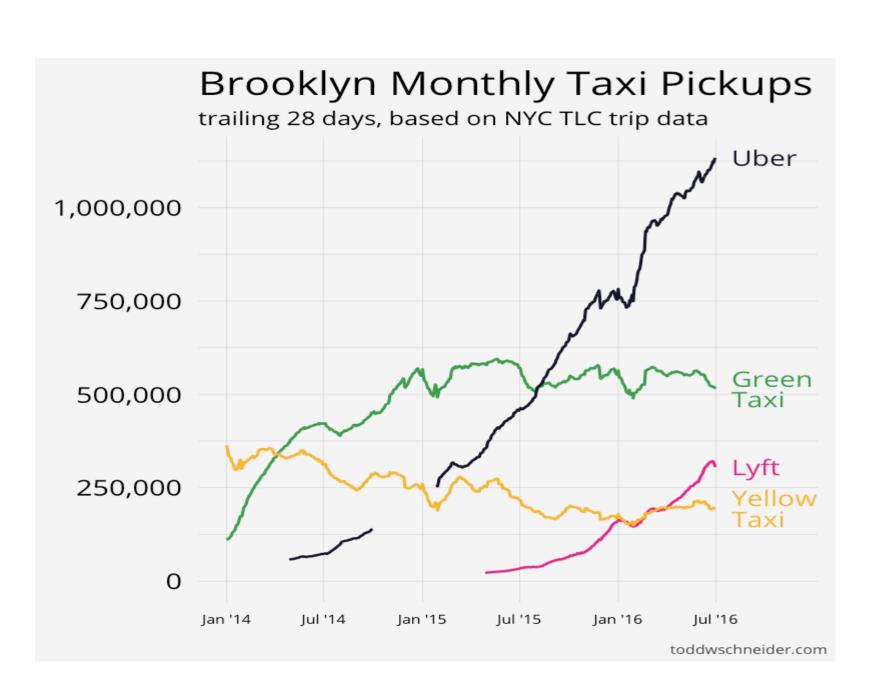
Uber!

- Everyone is talking about Uber
- Is it the Next Big Thing?
- Hard to explore as data is retained by the company
- Limited samples of data available
- Many issues related to existing providers and regulation of activity
- Uber is very aggressive in their marketing, planning and management of regulation.



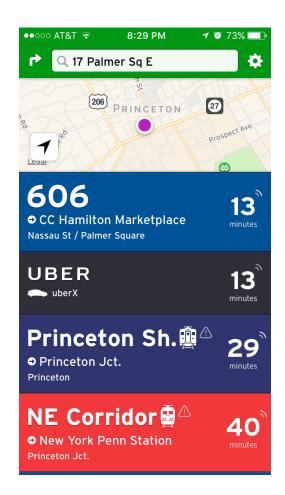
"between June 2014 and June 2015, the number of Uber pickups in Brooklyn grew by 525%"

Todd Schneider



Transit App

- The Transit App is a smartphone application that provides users with transit information and also other route planning options – including Uber requests
- The Transit App analyzes your device location or your request for information on a specific location and then calls transit maps and schedules to delivers custom transportation information to the user
- They can also request an Uber pickup which is then processed by Uber
- The authors have a research agreement with Transit App to have access to the recorded information of user activity.



Transit App Screen Shot – Princeton Location

What You are Seeing

- The data is painting a picture of consumer demand for rides across the state.
- How and why a consumer wants a ride and also calls it via a transit based app is an interesting matter to explore.
- We are also examining if the Uber Calls via the Transit App are different in usage pattern to call made by other means

Transit App Maps

Uber Calls by Region

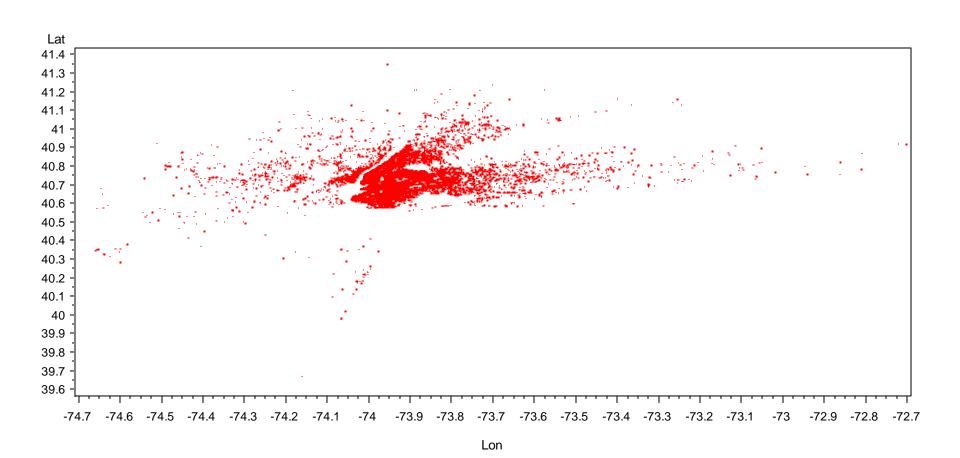
J. Peters and C. Brakewood

Through August 22, 2016

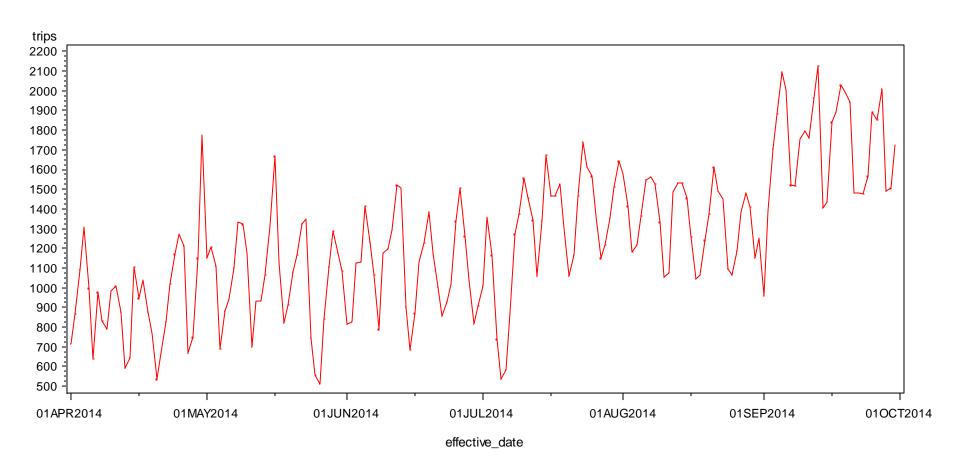
First Task - Describe the Data

- Record Count
- Long Term Trends
- Seasonality
- Geographic Dispersion of Usage
- Linkage of Usage to Various Causal Factors
- Compare the Transit App Uber Data to the New York City Taxi and Limousine Commission Uber Files

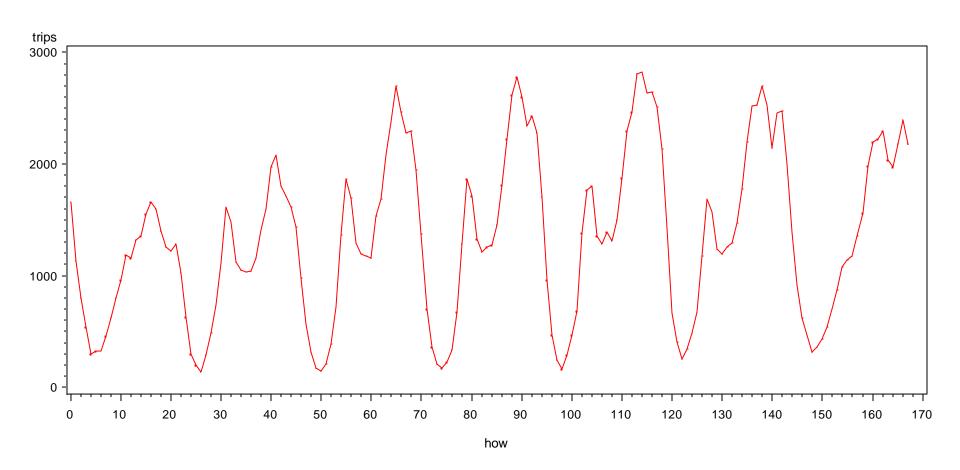
NYC Taxi and Limousine Commission – Uber Data



TLC Uber Daily Usage

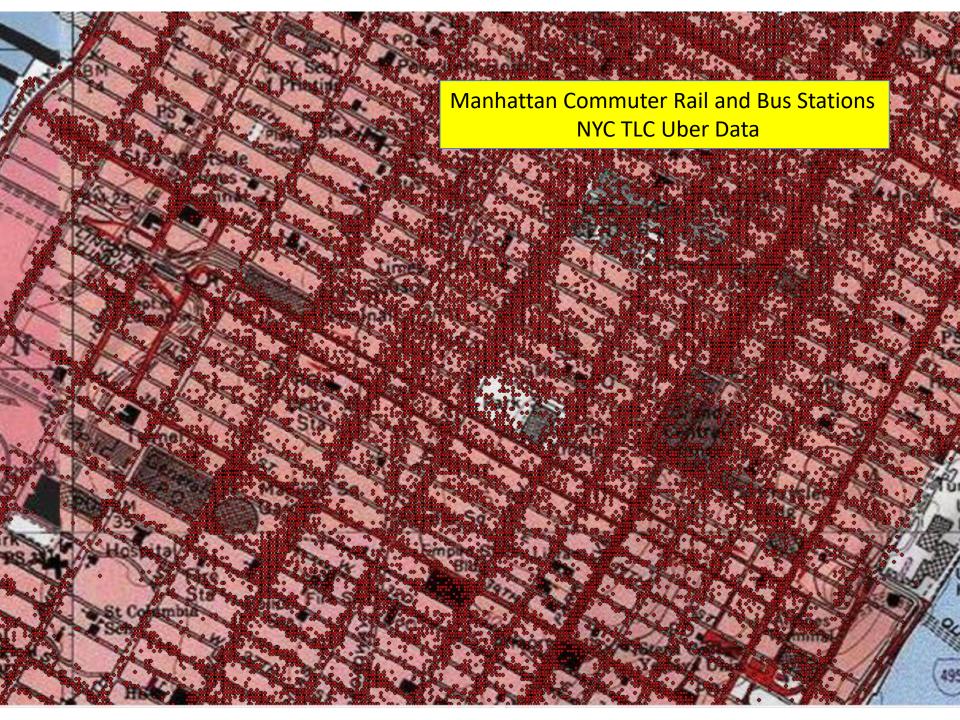


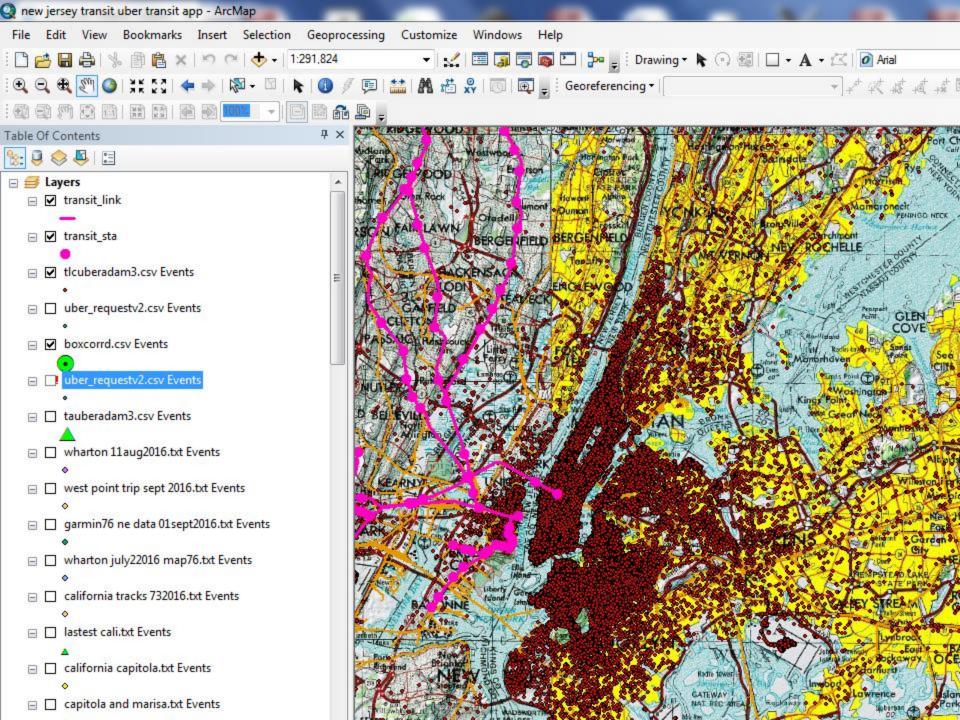
TLC Uber Data by Hour of Week

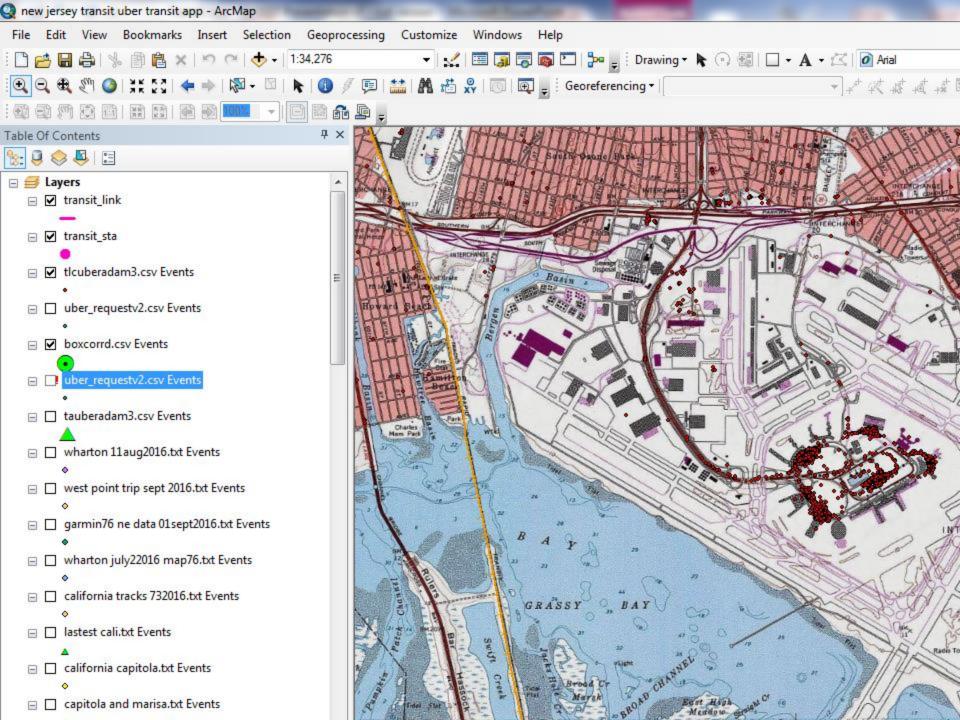


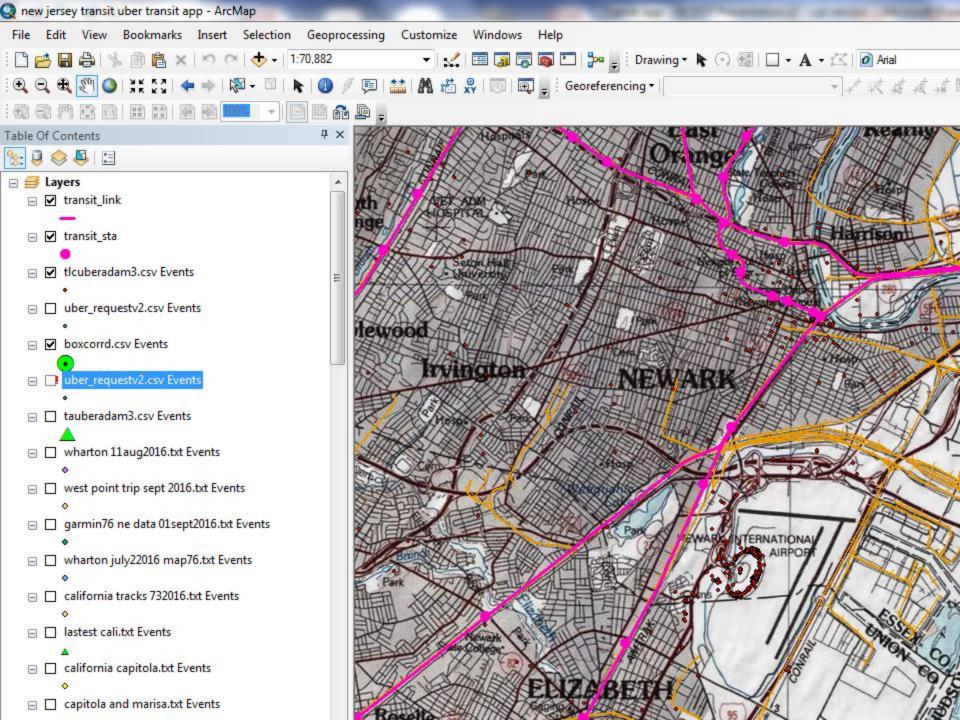
Uber Calls Near Commuter Rail

New York City Stations









Bill to regulate Uber, Lyft would require driver background checks

- "But Ana Mahony, Uber New Jersey general manager, said the bill needs work or the company
 might have to leave the state. "This bill would make it impossible for Uber to continue operating,
 not because we don't want to, but because it includes poison pills that have driven us out of other
 markets and would drive us out of New Jersey," she told the committee.
- A provision that would require an international background check for drivers to see if they have violations is a restrictive requirement that no other driver in the state has to meet, Mahony said.
- "There is no worldwide database of crimes to check," she said. "It sets an impossible standard for drivers that no state entity is capable of enforcing."
- Lyft officials expressed hope a compromise could be reached.
- "New Jersey deserves a permanent statewide ride sharing framework that provides clarity for drivers and passengers," said Chelsea Wilson, Lyft spokesperson. "We are pleased that both the Senate and Assembly are looking at common-sense ways to allow rides sharing to grow, and are confident that legislators will soon pass a comprehensive solution."
- Meanwhile, <u>some municipalities</u>, <u>such as Newark and Elizabeth have debated passing their own laws</u> governing background checks and insurance requirements for ride sharing companies."
- Larry Higgs Reporting on NJ.Com May 19, 2016

Driver Behavior

- Drivers can operate taxicab in any area of New York City that they wish.
- They can attempt to manage their trip outcomes by geo-locating the car to a desired location for pickups
- How do they operate and can we see variations in the patterns of operations?

Green Versus Yellow Cabs

Green Cabs

- Rates are the same as for yellow cabs
- Issuing 18,000 New Permits 6,000 Per Year
- Not allowed to accept street hails in parts of Manhattan (south of East 96th Street and West 110th Street) or at the city's airports
- Furnished with roof lights, meters and credit card readers
- Twenty percent are wheelchair accessible

Other Items

- Cost of converting to a green cab could cost livery drivers \$10,000, but some of these cars are worth less than the cost of the \$1,500 permit
- Drivers have to affiliate with a neighborhood base. There are 63 bases that have registered with the program: 22 in the Bronx, 17 in Brooklyn, 12 in Queens, 11 in Manhattan and one in Staten Island

Yellow Cabs

- \$2.50 upon entry, \$0.50 for each additional unit
- Fixed Number of Medallions 12,533
- Allowed to accept street hails in all areas of Manhattan. For trips between Manhattan and JFK Airport, the flat fare is \$52.00 plus any tolls
- Furnished with roof lights, meters and credit card readers
- Later this year, there will be an auctioning of 2,000 additional wheelchair-accessible yellow cab medallions

Other Items

Medallions can sell for up to \$1 million dollars

Regulatory Structure

- Will regulation be at the State Level?
- What type of regulation?
- For what purpose?

- Common Issues:
- Driver Quality
- Vehicle Insurance
- Vehicle Safety

Fare Rules

Questions?

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